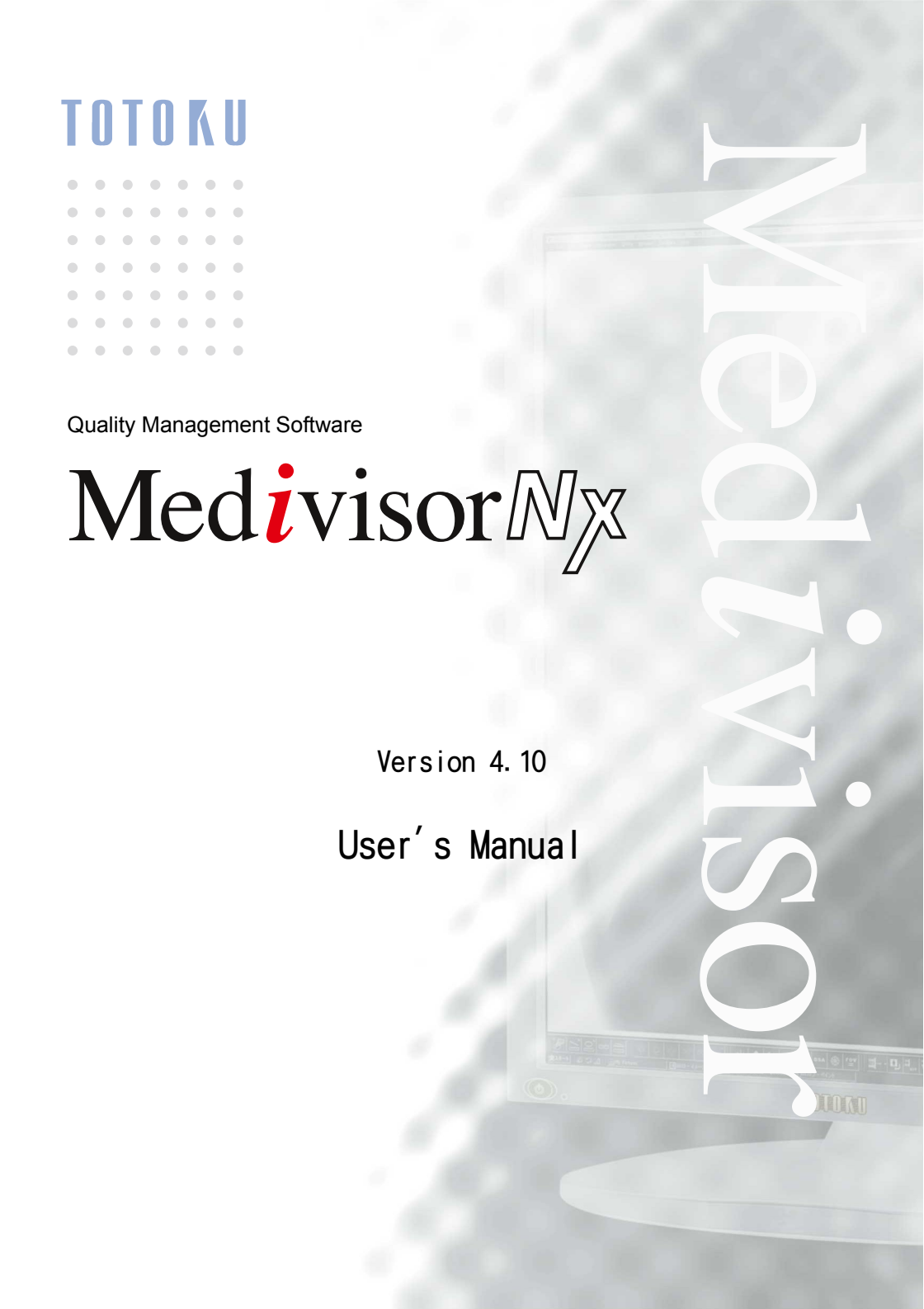
TOTOKU

Quality Management Software

MedivisorNx

Version 4.10

User's Manual



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1 Introduction

This document describes how to use the TOTOKU Medivisor Nx. Please read this user's manual before use to ensure proper functioning.

1.1 Overview

Medivisor Nx is software designed to manage the quality of TOTOKU medical image displays. The functions include:

- **Monitoring of display status**: The display configuration is recognized automatically and resident in the task tray, notifying the user of the display status. After starting the application, you can use this function to quickly check the display status. ➤p.12
- **Display Adjustment**: Perform various adjustments, including calibration to DICOM GSDF or other gamma curves and color settings (for color models only), as well as luminance and color uniformity (for supported models only). ➤p.14
- **Display Inspection**: Verify luminance, gamma, and color settings (for color models only). ➤p.18
- **Calibration History**: Easily check details of previously performed calibrations. ➤p.21
- **Test Pattern Display**: Display test patterns using AAPM TG18 or another QA testing standard. ➤p.23

1.2 Operating Environment

Computer	IBM PC/AT compatible machines equipped with processors equivalent to or exceeding Intel Pentium/Celeron 2 GHz and meeting recommended system requirements, and equipped with more than one USB port
System memory	512 MB or higher and meeting recommended system requirements
Operating system	Microsoft Windows 7 32/64-bit SP1 Microsoft Windows Vista 32/64-bit SP2 Microsoft Windows XP 32-bit SP3 / 64-bit SP2

Language		English Japanese
Supported display	USB	**Ms series**: MS55i2, MS53i2, MS51i2, MS35i2, MS33i2, MS31i2, MS25i2, MS23i2, MS21i2 **Me series i2 models**: ME551i2, ME355i2, ME253i2 **CCL series i2 models**: CCL650i2, CCL358i2, CCL356i2, CCL354i2, CCL352i2 plus, CCL352i2, CCL258i2, CCL256i2, CCL254i2, CCL252i2 **CCL series**: CCL242, CCL230
	DDC/CI	**CCL series**: CCL208, CCL240
Connectable displays		Maximum of 6
Supported calibration sensors		Chroma5 (recommended) DTP94

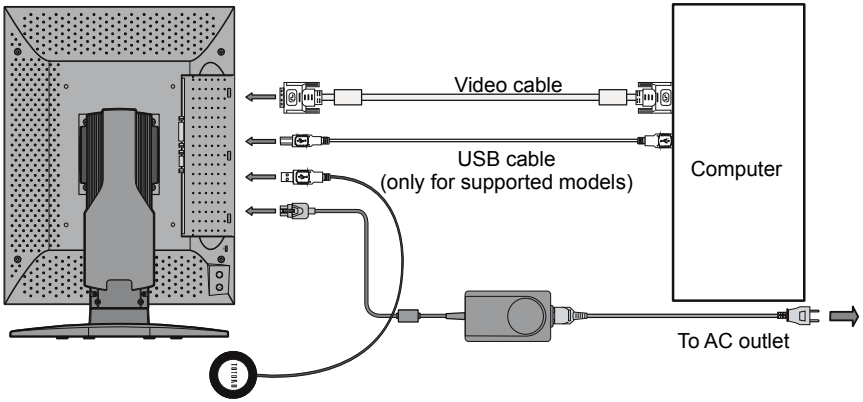
2 Installation

This chapter explains how to connect cables and install the hardware and software. Make sure to log in as a user with administrative privileges on a local computer before starting installation of Medivisor Nx.

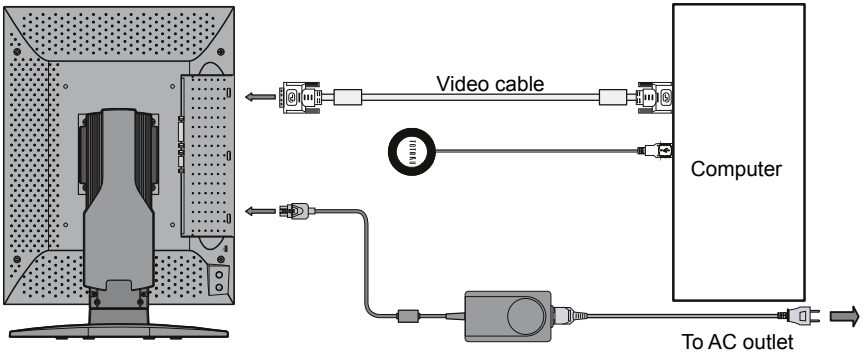
2. 1 **Installing the Display**

Connect the video cable and USB cable (a USB communication type only) supplied with the display between the ports on the display and the computer. For detailed information on cable connections, refer to the display user manual.

● USB connection models



● DDC/CI connection models

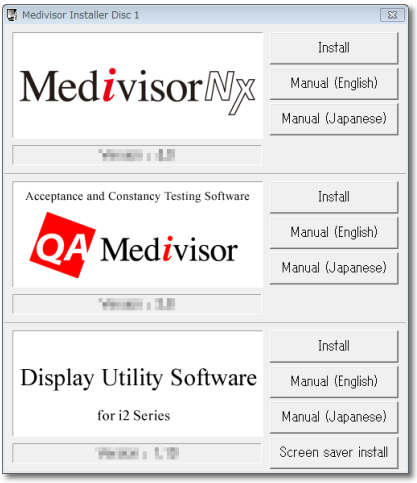


2. 2 Installing Medivisor Nx

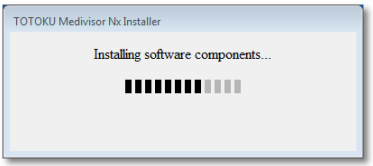
Medivisor Nx is software that replaces the earlier calibration software Medivisor for i2 Series and Medivisor for CCL208/CCL240.

1. Uninstall previous versions of the software.
   - Medivisor for i2 Series
   - Medivisor for CCL208/CCL240
   - Medivisor Agent Services
   - TOTOKU DDC Driver

2. Click **Install** for Medivisor Nx on the software installer (Medivisor Installer) window. Otherwise, reinsert the CD-ROM (Disc 1) or run launcher.exe on the CD-ROM to start the installer.



3. The related software[1] is installed first. Wait until the software is installed.



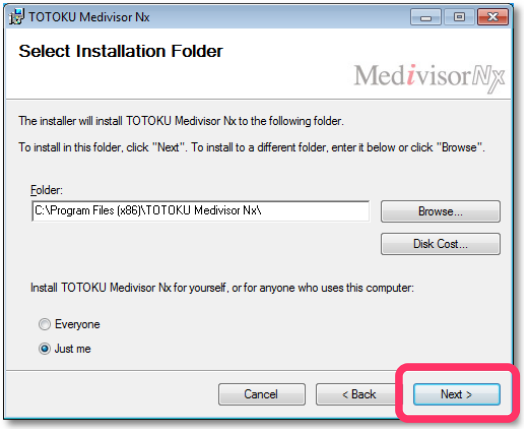
1 Medivisor Agent Services and TOTOKU DDC Driver

4. When installation is completed, the Medivisor Nx setup wizard starts. Click **Next >** to begin the installation of Medivisor Nx.

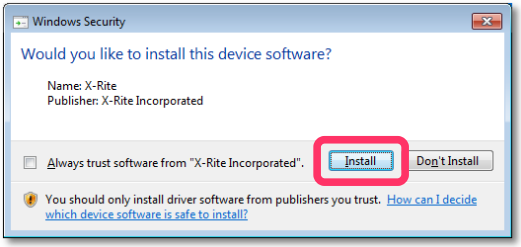
5. The **License Agreement** window appears. To accept the agreement and proceed with installation, select "I Agree" and click **Next >**.

TOTOKU Medivisor Nx
License Agreement
MedivisorNx
Please take a moment to read the license agreement now. If you accept the terms below, click "I Agree", then "Next". Otherwise click "Cancel".
Software License Agreement
Mr. Hideyuki Inoue
Director, General Manager
Intelligent Devices and Solutions Division
TOTOKU ELECTRIC CO., LTD.
1-11, Shinbashi 6-Chome, Minato-ku
Tokyo, 105-0004 Japan
I Do Not Agree
I Agree
Cancel
Next >

6. When the **Select Installation Folder** window appears, select a destination folder. Further down the screen you can select which user's **Start** menu the shortcut to this software should be created. To share it with all users of the destination computer, select "Everyone". To use it by yourself, select "Just me". Then click **Next >**.


TOTOKU Medivisor Nx
Select Installation Folder
MedivisorNx
The installer will install TOTOKU Medivisor Nx to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\Program Files (x86)\TOTOKU Medivisor Nx\
Browse...
Disk Cost...
Install TOTOKU Medivisor Nx for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >

7. When the **Confirm Installation** window appears, click **Next >** to start installation.
8. During the installation, the following message may appear. In this case, just click **Install** to continue.


Windows Security
Would you like to install this device software?
Name: X-Rite
Publisher: X-Rite Incorporated
Always trust software from "X-Rite Incorporated".
Install
Don't Install
You should only install driver software from publishers you trust. How can I decide which device software is safe to install?

9. When the **Installation Complete** window appears, click **Close** to complete installation. Remove the CD-ROM from the CD drive.
10. A message prompting restart of the computer appears. Click **Yes** and restart the computer.

After the computer restarts, Medivisor Nx starts and the display configuration is detected automatically. All displays, not only supported displays, are detected. Normally, you can use Medivisor Nx as is.

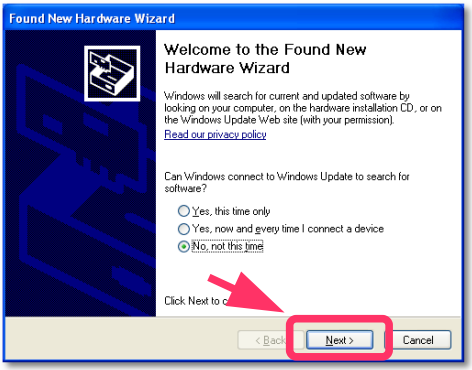
However, if the display configuration cannot be detected properly, or the display is not set with the QA testing standard, the display must be configured manually. ➡p.25

2. 3 Installing the Calibration Sensor Driver

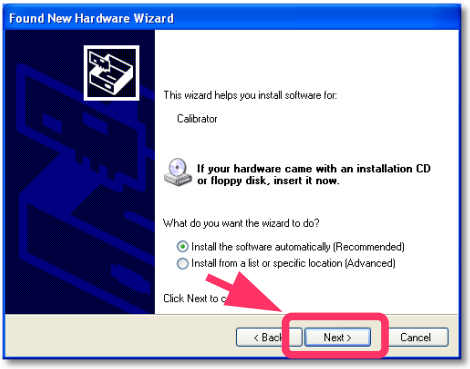
Follow the instructions below to install the calibration sensor driver. There are two ways and it depends on the Operating System you are using.

● For Windows XP

1. Connect the calibration sensor Chroma5 to the display or the USB port on the computer.
2. The Found New Hardware Wizard appears. Select "No, not this time," and click **Next >**.


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to
< Back
Next >
Cancel

3. The following screen appears. Select "Install the software automatically [Recommended]," and click **Next >** to install the driver.

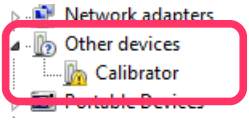

Found New Hardware Wizard
This wizard helps you install software for:
Calibrator
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to
< Back
Next >
Cancel

4. When the Medivisor Nx installation has been properly completed, the driver software is

automatically found and installed. If the driver is not found in this step, or to connect a sensor other than Chroma5, insert the supplied CD-ROM (Disc 1) in the CD drive on the computer, and take the same steps.

● For Windows Vista and Windows 7

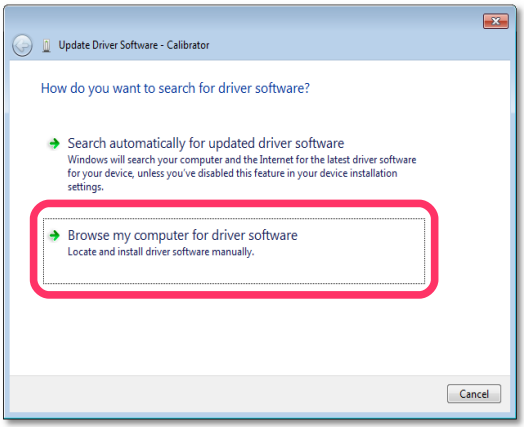
1. Connect the calibration sensor Chroma5 to the display or the USB port on the computer.
   - When the Medivisor Nx installation has been properly completed, the message "Device driver software was successfully installed" appears. The driver installation has been completed successfully.
   - When the message "Device driver software was not successfully installed" appears, first install Medivisor Nx and connect Chroma5. If it still fails, go to the next step.
2. Right-click **Computer**[2] on the Start menu and select **Manage**.
3. In the left pane of the window, select **Device Manager** under **System Tools**.
4. Double-click **Calibrator** under **Other devices**.



2 The description "Computer" can be "My computer" depending on the Operating System you are using.

5. On the **driver** tab, click **Update driver** to open **Update Driver Software Wizard**.

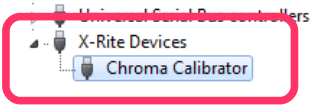
6. Click **Browse my computer for driver software**.


Update Driver Software - Calibrator
How do you want to search for driver software?
Search automatically for updated driver software
Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.
Browse my computer for driver software
Locate and install driver software manually.
Cancel

7. Insert the supplied CD-ROM (Disc 1) in the CD drive on the computer and select the CD drive as the location of the driver.

8. Windows finds the driver and installs it automatically.

9. Return to the Device Manager and check that **Chroma Calibrator** is displayed under **X-Rite Devices**.



3 Main Functions

Medivisor Nx comes with the necessary functions for managing the precision of the display for displaying medical images.

3. 1 Main Menu and Task Tray Icon

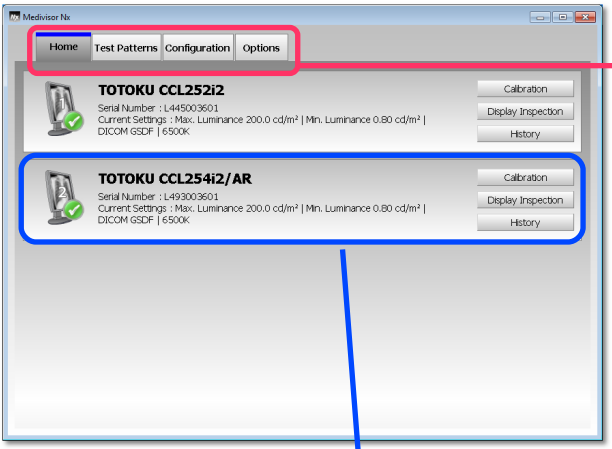
When Medivisor Nx logs in to Windows, it resides in the task tray with an icon that can be monitored to notify the user of the display status.(You can set whether or not Medivisor Nx resides in the task tray. ➡p.29)

Medivisor Nx task tray icon

The icons in the task tray have the following meanings

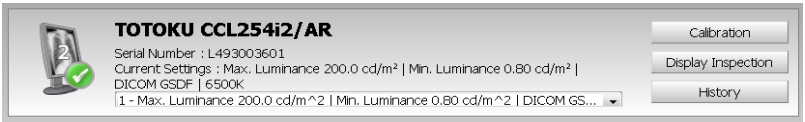
Icon	Explanation
	Normal: Operating normally.
	Warning: Display status cannot be verified.
	Error: Display error detected.

The detailed status of warnings and errors are displayed on the main menu. To open the main menu, select **Medivisor Nx** on the Start menu or right-click the task tray icon and select **Open Medivisor Nx**.



- **Home** tab
- **Test Patterns** tab
  (P.23)
- **Configuration** tab
  (P.25)
- **Options** tab
  (P.29)

When multiple display configurations are enabled in the Option tab


TOTOKU CCL254i2/AR
Serial Number : L493003601
Current Settings : Max. Luminance 200.0 cd/m² | Min. Luminance 0.80 cd/m² |
DICOM GSDF | 6500K
1 - Max. Luminance 200.0 cd/m^2 | Min. Luminance 0.80 cd/m^2 | DICOM GS...
Calibration
Display Inspection
History

- Placing the mouse cursor over the display icon on the main menu displays an explanation of the display status. p.31
- When multiple display configurations are enabled, select the display configuration in the drop-down box. p.29

3.2 Calibration

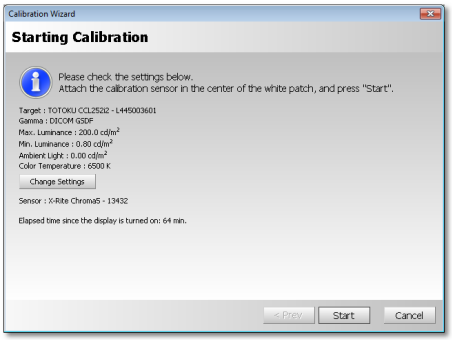
Perform calibration by using the **Calibration** button on the Home tab. Clicking **Calibration** for the display to be adjusted displays the **Starting Calibration** window.

For models equipped with a front sensor, calibration can be performed for both the front sensor and external sensor. When an external sensor is connected, clicking **Calibration** enables the external sensor to be used. When an external sensor is not connected, the front sensor is used[3].

Important

For more accurate calibration, use external sensor to perform calibration.

When a calibration is performed using the external sensor, a calibration of the front sensor is also performed. Perform a calibration using the external sensor regularly, about once a year.


Calibration Wizard
Starting Calibration
Please check the settings below.
Attach the calibration sensor in the center of the white patch, and press "Start".
Target : TOTOKU CCL25212 - L445003601
Gamma : DICOM GSDF
Max. Luminance : 200.0 cd/m²
Min. Luminance : 0.80 cd/m²
Ambient Light : 0.00 cd/m²
Color Temperature : 6500 K
Change Settings
Sensor : X-Rite ChromaS - 13432
Elapsed time since the display is turned on: 64 min.
< Prev
Start
Cancel

Check the following information on the **Starting Calibration** window.

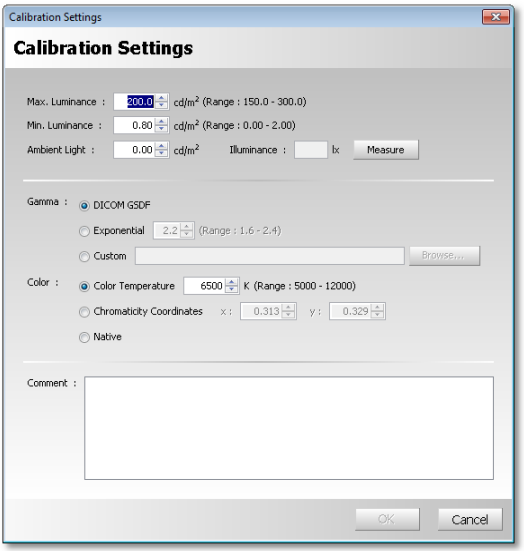
- **Calibration Settings**: Displays the calibration settings. Displays the previous calibration results by default. To change the settings, click **Change Settings**.
- **Sensor**: Displays the sensor used for calibration. If zero calibration with the sensor is required, the **Zero Calibration** button is displayed. Place the sensor on an even surface and click the button.
- **Elapsed time since the display is turned on**: Displays the elapsed time since the display was turned on[4]. If the elapsed time is too short, calibration cannot be performed accurately. Wait at least 60 minutes after the display is turned on before beginning

3 If you try to perform calibration on a model not equipped with a front sensor, or the sensor manual selection option is enabled (▶p.29) and you select external sensor, the external sensor is selected.

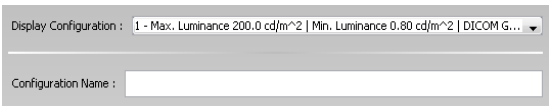
4 This is the elapsed time since the display was turned on. If the power save function is enabled or power is turned off, the value returns to 0.

calibration.

The following items can be changed on the **Calibration Settings** dialog that appears when clicking **Change Settings**.


Calibration Settings
Calibration Settings
Max. Luminance : 200.0 cd/m² (Range : 150.0 - 300.0)
Min. Luminance : 0.80 cd/m² (Range : 0.00 - 2.00)
Ambient Light : 0.00 cd/m² Illuminance : lx Measure
Gamma :
DICOM GSDF
Exponential 2.2 (Range : 1.6 - 2.4)
Custom Browse...
Color :
Color Temperature 6500 K (Range : 5000 - 12000)
Chromaticity Coordinates x : 0.313 y : 0.329
Native
Comment :
OK
Cancel

When multiple configurations are enabled, the following items are also displayed. ➤p.29



Setting	Explanation	Additional information
Display Configuration	Select the display configuration to be adjusted.	This can only be set when multiple configurations are enabled with the Medivisor Nx settings. ➤p.29
Configuration Name	Specify the name of the configuration. This can be left blank.	

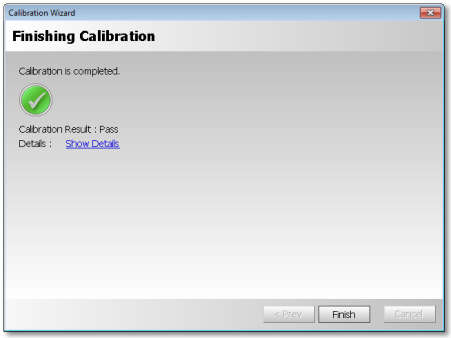
Setting	Explanation	Additional information
Max. Luminance	Specify the luminance (cd/m^2) when white is displayed. Use the default value unless otherwise required. Maximum luminance can be set within the range specified on the screen. However, due to luminance degradation caused by deterioration of the backlight, the result may fall short of the target luminance.	For color models, the range that can be set to the maximum luminance varies depending on the color settings.
Min. Luminance	Specify the luminance (cd/m^2) when black is displayed. Use the default value unless otherwise required.	
Ambient Light	Specify the luminance (cd/m^2) affecting the display surface according to the ambient light.[5] If the effect of ambient light does not need to be taken into account, use the default value of 0.0 cd/m^2 .	For models that are compatible with measuring light, the **Measure** button is displayed.[6]
Gamma	Specify the gamma properties. ▶p.37 If black-and-white images will primarily be displayed, DICOM GSDF is recommended.	
Color	Specify the color. If the native colors are specified, the original color properties of the LCD display will be used as is.	This can be set only for color models.
Comment	Add a comment at the time of adjustment for later reference. This can be left blank.	

5 When ambient light is set, the ambient light value will be added to the resulting maximum and minimum luminance.

6 Measurement using the light sensor within the display uses a proprietary method. To manage displays according to QA testing standards, refer to respective relevant standards.

After verification is complete, install the sensor properly (➡p.36) and click **Start** to begin calibration.[7]

When calibration is completed, the **Finishing Calibration** window is displayed together with the results.



Result	Explanation
Pass	Calibration completed normally, and it also passed inspection.
Fail	Calibration completed normally, but during inspection, a deviation was outside the appropriate range (➡p.43). Allow for more elapsed time since the display was turned on, and then perform calibration again. If the result is still Fail, the display may have a problem.

Click Show Details to display the details of the calibration results in a graph. (For how to read the graphs ➡p.42)

7 You can cancel adjustment by pressing the ESC key on the screen during adjustment or by clicking **Cancel** in the wizard.

3.3 Display Inspection

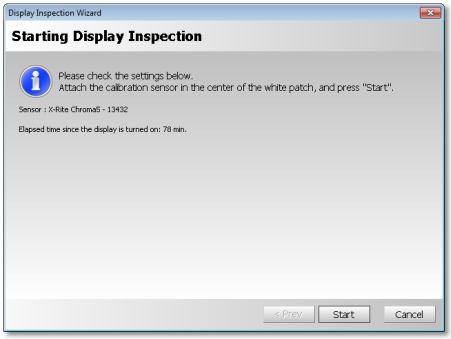
Clicking **Display Inspection** on the Home tab starts the display inspection[8].

> **Important**
>
> For more accurate calibration, use external sensor to perform calibration.

For models equipped with a front sensor, inspection can be performed for both the front sensor and external sensor. When an external sensor is connected, clicking **Display Inspection** enables the external sensor to be used. When an external sensor is not connected, the front sensor is used.[9]

If the front sensor is selected and at least 60 minutes have elapsed since the display was turned on, inspection begins immediately. Otherwise, the **Starting Display Inspection** window appears.

Check the following information on this window.


Display Inspection Wizard
Starting Display Inspection
Please check the settings below.
Attach the calibration sensor in the center of the white patch, and press "Start".
Sensor : X-Rite ColorMunki - 13432
Elapsed time since the display is turned on: 78 min.
< Prev
Start
Cancel

- **Sensor**: Displays the sensor used for inspection. If zero calibration with the sensor is required, the **Zero Calibration** button is displayed. Place the sensor on an even surface and click the button.
- **Elapsed time since the display is turned on**: Displays the elapsed time since the display was turned on[10]. If the elapsed time is too short, inspection cannot be performed accurately. Wait at least 60 minutes after the display is turned on before beginning inspection.

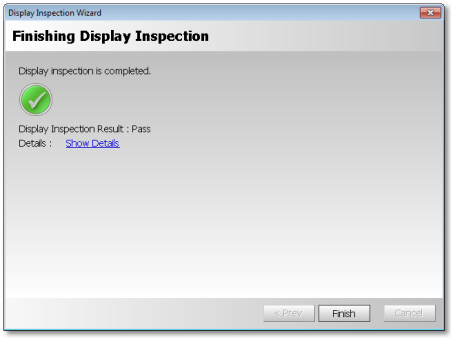
8 When CCL208, CCL240, CCL242 and CCL230 have never been calibrated, the inspection is unavailable, and the Display inspection button becomes disabled.

9 If you try to perform an inspection on a model not equipped with a front sensor, or the sensor manual selection option is enabled (▶p.29) and you select external sensor, the external sensor is selected.

10 This is the elapsed time since the display was turned on. If the power save function is enabled or power is turned off, the value returns to 0.

After verification is complete, install the sensor properly (▶p.36) and click **Start** to begin display inspection.[11]

When inspection is completed, the **Finishing Display Inspection** window is displayed together with the results.



Result	Explanation
Pass	The inspection result passed.
Fail	The inspection result failed. Perform calibration.

Click Show Details to display the details of the inspection results in a graph. (For how to read the graphs ▶p.42)

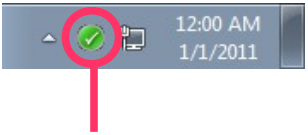
11 You can cancel inspection by pressing the ESC key on the screen during inspection or by clicking **Cancel** in the wizard.

3. 4 Regular Contrast Response Test and Regular Contrast Measurement

When Medivisor Nx is installed, a display inspection is performed regularly, and if an abnormality is found, this is indicated in the task tray icon and **Home** tab of the main menu.

When an inspection error has occurred

Display icon



Task tray icon

The following are the two inspection items.

Setting	Description	Supported models
Contrast response test	Uses the front sensor to perform an inspection of the contrast response properties. If the deviation calculated based on the properties greatly exceeds the standard value, an error occurs.	Models with a front sensor
Luminance measurement	Uses the display internal sensor to perform an inspection of the brightness of the backlight. If the brightness greatly exceeds the calibrated brightness, an error occurs.	CCL208 CCL240 CCL242 CCL230

4 Useful Functions

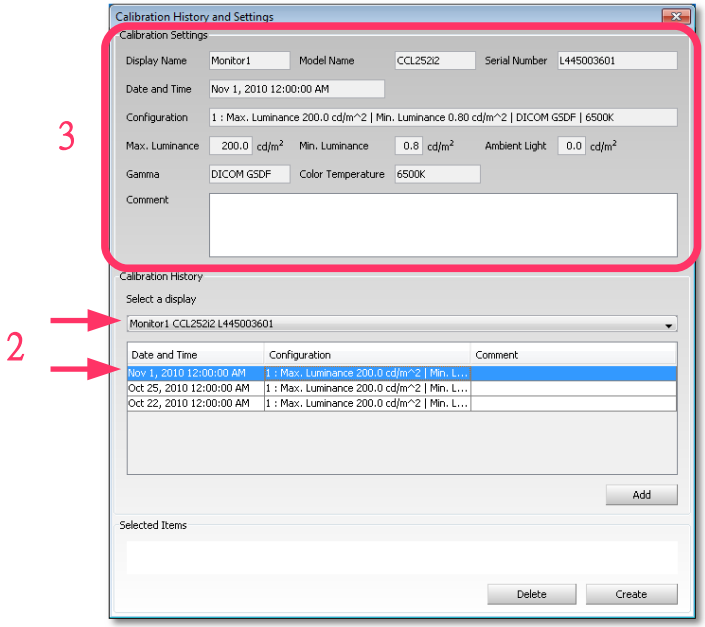
Medivisor Nx comes with useful functions for managing the precision of the display for displaying medical images. You can perform detailed analysis of the display quality and manage complex display configurations.

4. 1 Calibration History

You can display the results of previously performed calibrations both graphically and numerically.

● Displaying the detailed calibration information

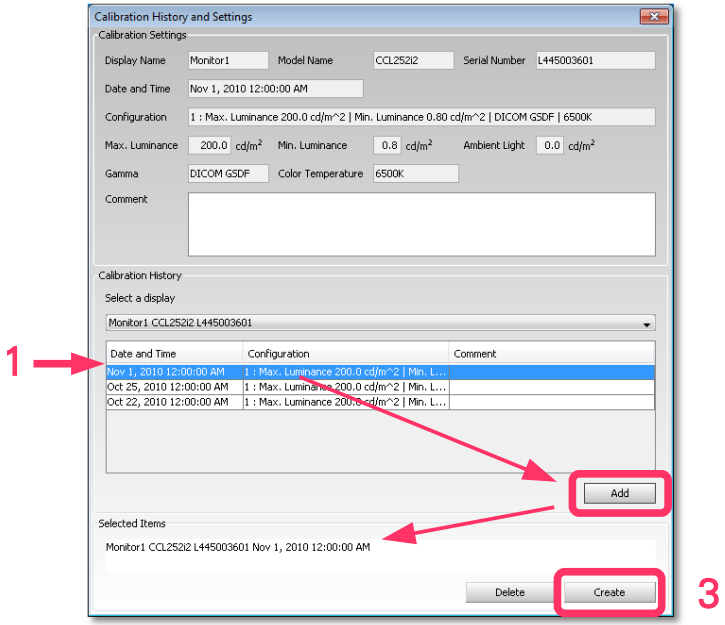
1. Click **History** on the **Home** tab of the main menu.[12]
2. Select a display in the **Calibration History** section. The calibration history for the selected display appears below.
3. Select a record from the calibration history to display the detailed settings information in the **Calibration Settings** section.



12 If a calibration has not been performed, the **History** button is disabled.

● Displaying the calibration results graphically

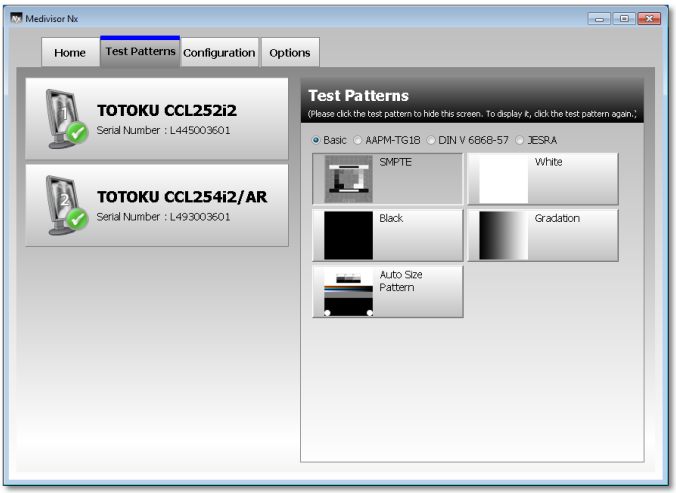
1. Select a calibration record and click **Add** to add it to the **Selected Items** section.
2. To compare with other records, select multiple records using the same procedure. You can compare two records graphically at the same time.
3. Click **Create**. (For how to read the graphs ➤p.42)



4. 2 Test Pattern Display

You can display a full-screen test pattern stipulated by QA testing standards.

To display a test pattern, select **Test Patterns** on the main menu. The selected test patterns are displayed on the selected display. (For the available test patterns ▶p.38)

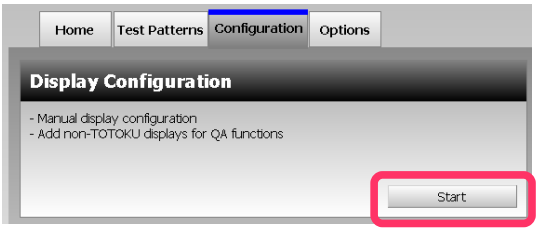


4. 3 Setting a QA testing standard

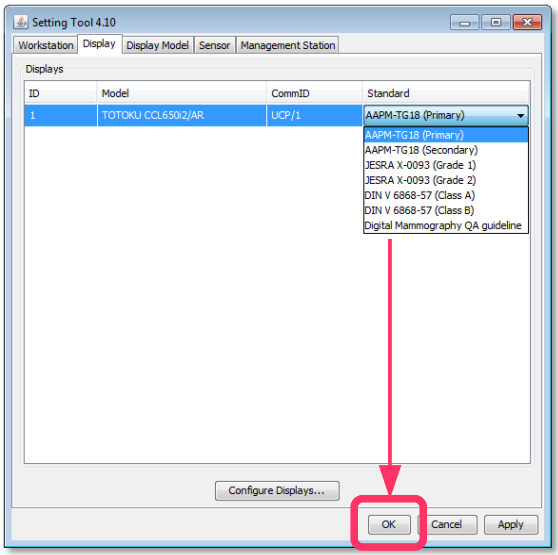
To perform QA testing by QA Medivisor, a QA testing standard needs to be set for the displays registered in Medivisor Agent Services.

Perform the following steps.

1. Open the **Configuration** tab on the main menu and click **Start** on the Display Configuration screen.



2. Setting Tool starts with the **Display** tab selected. Select a QA testing standard for the display to be set and click **OK**.



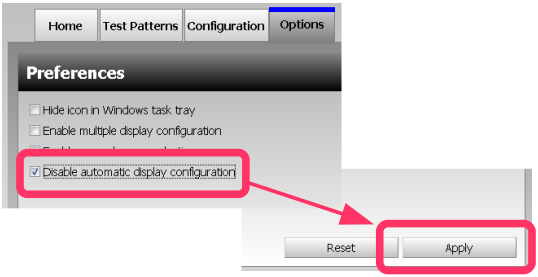
4. 4 Manual Display Configuration

By default, Medivisor Nx automatically detects the display configuration. Usually, this function correctly recognizes the display configuration, so adjustments are made without having to make any settings. In the following cases, however, the display configuration must be set manually.

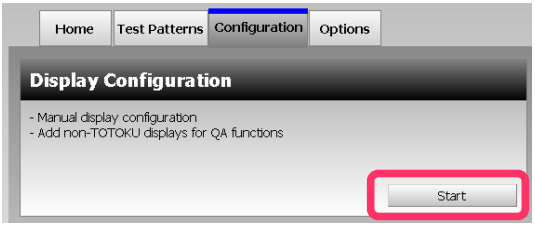
- When a display is operating in Stretch mode[13]
- When registering a display of a model not supported by Medivisor Nx as the display for QA testing by QA Medivisor.

If a display configuration must be set manually, use the following procedure:

1. Open the **Options** tab on the main menu and select the **Disable automatic display configuration** option.
2. Click **Apply**. Medivisor Nx restarts with automatic configuration disabled.

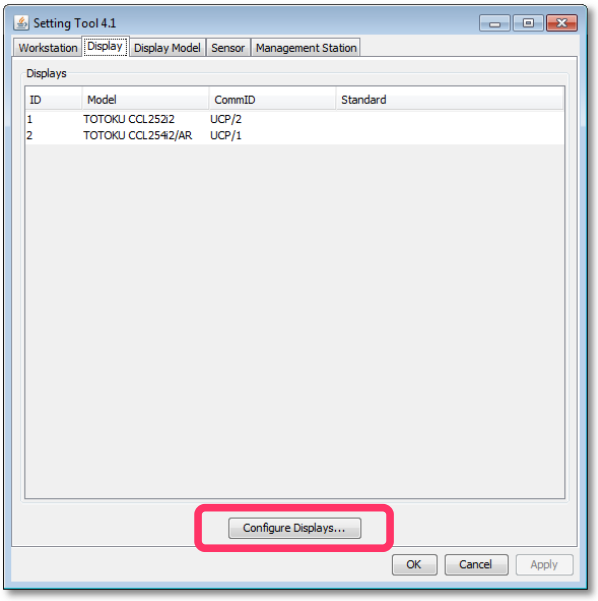


3. Open the **Configuration** tab and click **Start** for Display Configuration.

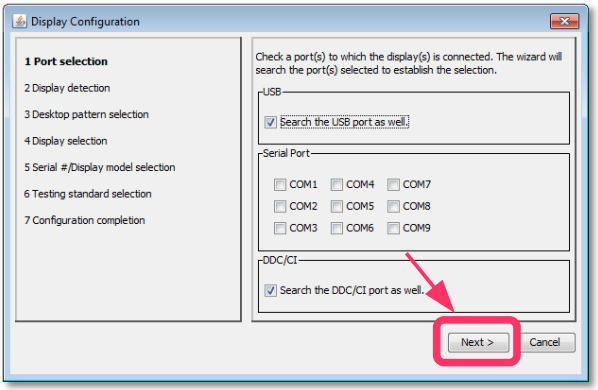


13 This is a graphics card display mode that handles multiple displays as one display. When set to this mode, multiple displays are recognized in Windows as one desktop.

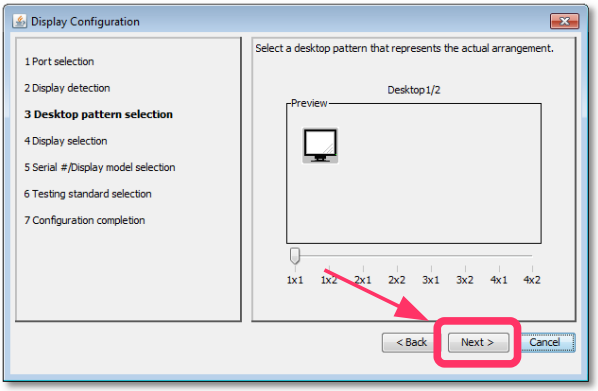
4. **Setting Tool** starts with the **Display** tab selected. Click **Configure Displays...**



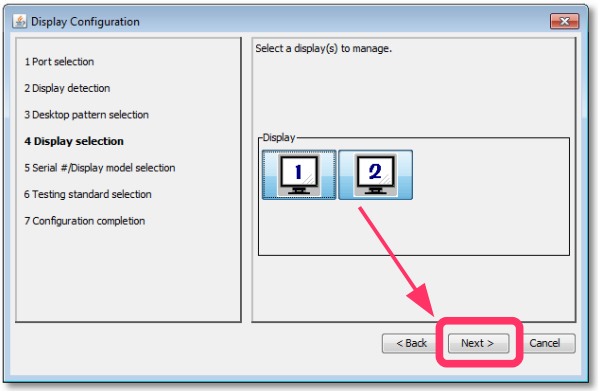
5. Select a port to use for communicating with the displays (➡p.4) and click **Next >**.



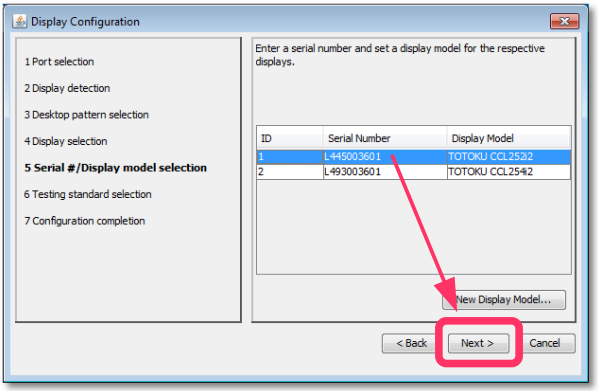
6. Select a desktop pattern that represents the actual display arrangement using the slider and click **Next >**. This step repeats itself as many times as the number of displays.



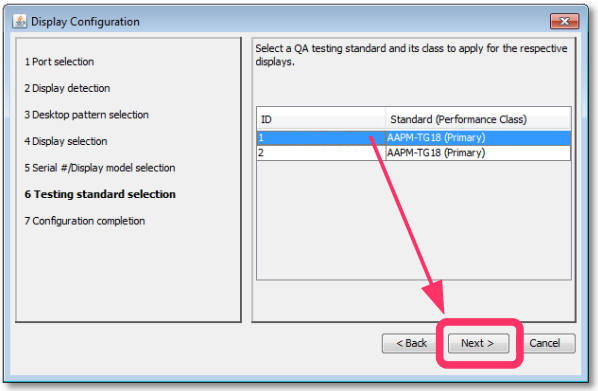
7. All connected displays are displayed. The same number is also displayed at the top right of the display. Select a display(s) to manage and click **Next >**.



8. Select a serial number that matches the one that is found on the product label attached to the display or on the OSD control panel. Likewise, select a display model and click **Next >**.[14]



9. Select a QA testing standard and its performance class to apply for each display and click **Next >**. To not apply the QA testing standard, select "AAPM TG18" for the QA testing standard and "Secondary" for the performance class.



10. Click **Save** to save the configuration and exit the wizard. Clicking **OK** on the setting tool to close the application loads the set configuration and restarts Medivisor Nx.

14 The serial number can be verified using the on-screen display. For information on verifying the serial number, refer to the display user manual.

4.5 Options

Medivisor Nx has the following options for changing software operations. To change the settings, open the **Options** tab on the main menu.

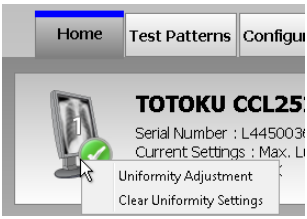
After you configure the settings, click **Apply** to apply the settings to Medivisor Nx.

Setting	Explanation
Hide icon in Windows task tray	When this is selected, the icon does not reside in the task tray. Closing the main menu exits the application.
Enable multiple display configuration	Displays and enables switching of display configurations using the Home tab on the main menu and calibration settings.
Enable manual sensor selection	Enables manual selection of the front sensor and external sensor when performing calibration and inspection.
Disable automatic display configuration	When this is selected, a registered display configuration is used instead of performing an inspection of the current display configuration when starting an application. Select this option when using the setting tool to configure the display configuration manually. ➤p.25

4. 6 Uniformity Adjustment and Clear Uniformity Settings

Supported models: MS series, ME series i2 model, CCL series i2 model

Uniformity Adjustment is used to adjust the uniformity of a display's luminance and color. Using a supported model, right-click the icon of a display on the **Home** tab to perform **Uniformity Adjustment** and **Clear Uniformity Settings**.



- **Uniformity Adjustment**: Select this menu item to display the **Starting Uniformity Adjustment** window. An external sensor is required to perform uniformity adjustment. After the window opens, follow the on-screen instructions to make adjustments.[15]
- **Clear Uniformity Settings**: Select this menu item to display the **Starting the Processes - Clearing Uniformity Settings** window. After the window opens, follow the on-screen instructions to make adjustments.

Important

Install the sensor as illustrated to the right. Otherwise, it may lead to inaccurate adjustments.

15 You can cancel adjustment by pressing the ESC key on the screen during adjustment or by clicking **Cancel** in the wizard.

5 Uninstallation

To uninstall Medivisor Nx, select **Uninstall a program** from Control Panel and then select TOTOKU Medivisor Nx. Medivisor Nx and all related software[16] are uninstalled.

- If a message requesting an msi file appears during uninstallation, refer to Troubleshooting (➡p.33).
- After uninstallation, the installation folder may remain on the system. Delete this manually as needed.

6 Troubleshooting

6. 1 Display Status

The display status is indicated by the task tray icon and on the main menu. Placing the mouse cursor over the display icon on the **Home** tab on the main menu displays a detailed explanation of the display status.

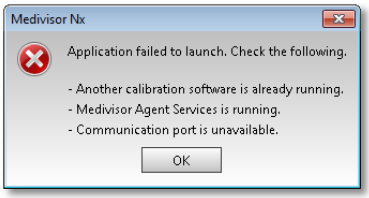
Icon	Message	Solution
	Status OK	
or	Communication Error	Check the connection between the computer and display. ➡p.5 When a communication error occurs for a display detected for the first time, appears. When a communication error occurs for a display previously detected, appears.
	Display Configuration Changed Try to register display again	The registered information of the display configuration and actual connection do not match. Try to register the display again. ➡p.25 Alternatively, display auto configuration is enabled. ➡p.29

16 Medivisor Agent Services and TOTOKU DDC Driver are uninstalled at the same time. If QA Medivisor is installed, a message appears prompting whether to uninstall Medivisor Agent Services.

Icon	Message	Solution
	No Video Cables	The registered information of the display configuration and actual connection do not match. Check the connection between the computer and display(▶p.5) and the on-screen settings. Try to register the display again as necessary. ▶p.25 Alternatively, display auto configuration is enabled. ▶p.29
	Unsupported Resolution	CCL650i2 is not recognized correctly. Check if it is connected to the computer correctly. ▶p.34
	Contrast Response Test Failed Calibration Recommended	Perform calibration. ▶p.14 If this error occurs, use of an external sensor is recommended.
	Luminance Change Larger Calibration Recommended	
No Icon	Unsupported Display	The display does not support calibration or other adjustments. It can be used as is.

6. 2 Other Problems

Problem: The message "Application cannot be started." appears and the application cannot be started.


Medivisor Nx
Application failed to launch. Check the following.
- Another calibration software is already running.
- Medivisor Agent Services is running.
- Communication port is unavailable.
OK

Solution: A communication error may occur when an application other than Medivisor Nx is communicating with the display. Before starting Medivisor Nx, be sure to close all other applications. Also, a display inspection may be running in the background, so wait a moment before starting the application.

Problem: The calibration sensor Chroma5 is not recognized even when connected, or an

error message, such as "Sensor not found," appears.

Solution: Depending on the computer, Chroma5 may not be recognized when the computer is turned on even if Chroma5 is connected.

How to find out whether or not the calibration sensor is recognized:

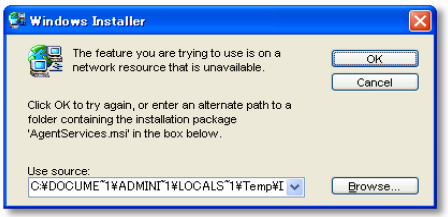
1. Right-click **Computer** on the Start menu and select **Manage**.
2. In the left pane of the window, select Device Manager under System Tools.
3. In the right pane of the window, check the Device Manager. If Chroma Calibrator is listed under X-Rite Devices, the calibration sensor is recognized; if it is not recognized, it appears as either Other Devices or USB Device.

How to get Chroma5 recognized:

If Chroma5 is not recognized even if the driver is installed, reconnect Chroma5 after the operating system has started.

If the driver is not installed, install it at this time. ➡p.9

Problem: An msi file of Medivisor Nx is required.


Windows Installer
The feature you are trying to use is on a network resource that is unavailable.
OK
Cancel
Click OK to try again, or enter an alternate path to a folder containing the installation package 'AgentServices.msi' in the box below.
Use source:
C:¥DOCUME~1¥ADMINI~1¥LOCALS~1¥Temp¥I
Browse...

Solution: In rare cases, a message requesting an msi file may appear during uninstallation. If the msi file is not specified, uninstallation cannot be completed.

Also, the message that requires an msi file appears when a file that forms part of Medivisor Nx is deleted accidentally.

In this case, use the following method to obtain the required msi file.

1. Insert the CD-ROM used for installation in the CD drive on the computer.
2. Select **Run** on the Start menu.
3. Click **Browse...** and specify the setup execution file in the **Medivisor Nx** folder on the CD-ROM.
4. The path of the setup execution file appears in the **Open** section. Add

a space to the end of the path and enter "/C". Now, ["<Medivisor Nx setup execution file name>"/C] should appear in the **Open** section.

5. Click **OK**.
6. A dialog box for specifying the location for extracting the file appears. Click **Browse** and specify the location for extracting the file. You can choose any writable folder for the location to which to extract the file.
7. Click **OK** to extract the msi file to the specified folder.

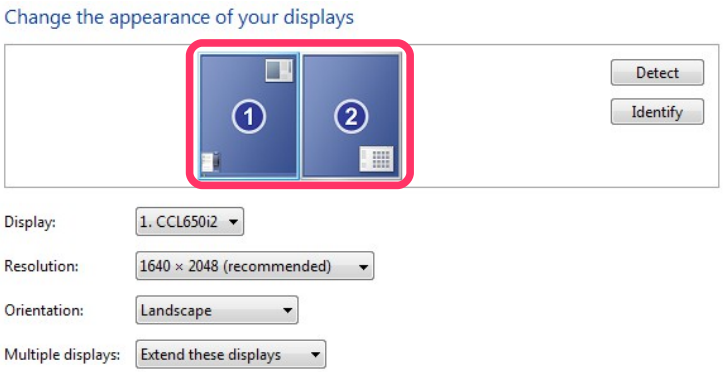
Specifying the extracted file continues the process.

Problem: CCL650i2 is not recognized correctly.

Solution: Check if the computer and CCL650i2 are connected correctly.

If CCL650i2 is connected to the computer with one display cable, set the desktop resolution at 3280 x 2048 or 3072 x 2048.

If CCL650i2 is connected to the computer with two display cables, set the resolutions of both desktop screens at 1640 x 2048 or 1536 x 2048 and set the two desktops side by side.



7 After-sales service

Contact your dealer for technical support.

◆ For more information on TOTOKU products, visit our web site at

www.totoku.com/display/

8 Appendix

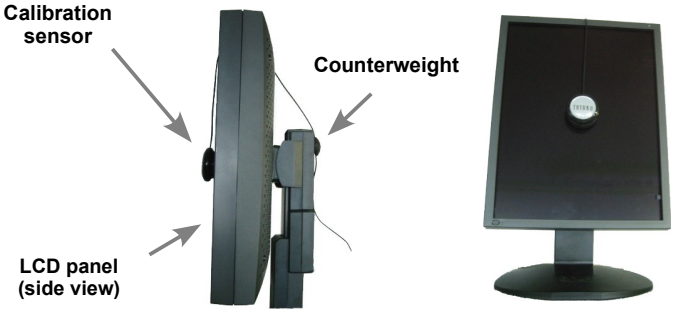
8. 1 Attaching the Calibration Sensor

This section explains how to attach the calibration sensor Chroma5.

1. Peel the paper off the adhesive pad.
2. Attach the sensor to the center of the measuring area by adjusting the position of the counterweight on the cord. Be careful not to damage the panel surface with either the calibration sensor or the counterweight.

Important

The calibration sensor can deteriorate if exposed to high temperature, high humidity, or rapid temperature change. When you do not use it, wrap it in a plastic bag and store in the packing case, as it was delivered.



When adhesion of the adhesive pad weakens, exchange it with the supplied replacement part according to the following procedure.

Replacement part (Upper side)

Replacement part (Reverse)

Turn the sensor replacement part to the left and remove it. Insert the replacement part and turn it to the right to attach it.

8.2 Gamma

Gamma	Explanation
DICOM GSDF	Grayscale display function set by the DICOM standard and commonly used for medical image display devices. This is set to match display luminance output to the perceptual capabilities of the human visual system.
Exponential	Gamma properties expressed by $y=x^n$, where n is a variable. Calibration setting to make an input signal to the display and display luminance exponential. The display luminance after calibration is proportional to the n-th power of the input signal. Generally, 2.2 or 2.4 is used for the exponential value n.
Custom	You can create and use user-defined gamma properties. To apply the properties to the display, create a custom gamma file and load it to Medivisor Nx.

8.3 Custom Gamma File

A custom gamma file is a file used to apply user-defined gamma properties to a display. This section describes the method for creating this file.

A custom gamma file is a text file. It can be edited using Notepad or another text editor. There are two file types, which provide the same functionality. When creating a new custom gamma file, use the standard custom gamma file format.

The standard format sample (sample.usg) is located in the var folder of the Medivisor Nx

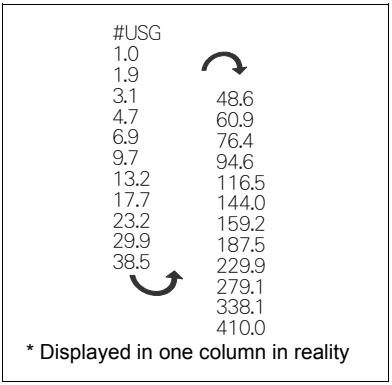
installation folder.

● Standard format

This explains how to create a custom gamma file using Notepad.

1. Open Notepad.
2. Enter "#USG" on the first line.
3. Describe the luminance properties on the next lines. Enter one luminance per line, in order from low to high luminance. Medivisor Nx interpolates any data insufficient for adjustment. You must enter at least five lines of data.
4. Select Save As from the menu.
5. Enter the file name. Add .usg as the file extension. Select **All Files** for Save as type: and click **Save**.

The following is an example of a standard-format custom gamma file.

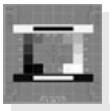


● Medivisor Color compatibility format

This is the the custom gamma file format of Medivisor Color. For detailed information on this file format, refer to the Medivisor Color user manual.

8.4 Test Patterns

● Basic patterns



SMPTE

SMPTE (Society of Motion Picture and Television Engineers) medical diagnostic imaging test pattern

White

White solid pattern

Black

Black solid pattern

Gradation

White to black gradation pattern

Auto Size Pattern

Auto-size pattern for analog video signal

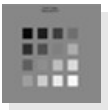
● AAPM-TG18

TG18-QC

Resolution, luminance, distortion, artifacts

TG18-PQC

Resolution, luminance, contrast for prints



TG18-CT

Luminance response

TG18-LN8-01

Luminance response. The pixel value of the central region is 0.

TG18-LN8-18

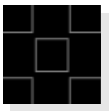
Luminance response. The pixel value of the central region is 255.

TG18-UN10

Luminance and color uniformity

TG18-UN80

Luminance and color uniformity

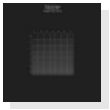


TG18-UNL10

Luminance and color uniformity with defining lines

TG18-UNL80

Luminance and color uniformity with defining lines



TG18-AD

Contrast threshold at low luminance for evaluating diffuse reflection

TG18-MP

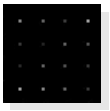
Luminance response (bit-depth resolution)

TG18-RH

5 horizontal lines at 3 luminance levels for LSF evaluation

TG18-RV

5 vertical lines at 3 luminance levels for LSF evaluation



TG18-PX

Array of single pixels for spot size

TG18-CX

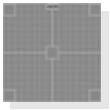
Array of Cx patterns and a scoring reference for resolution uniformity

TG18-LPH

Horizontal bars with 1 pixel width and 1/16 modulations at 3 luminance levels

TG18-LPV

Vertical bars with 1 pixel width and 1/16 modulations at 3 luminance levels



TG18-AFC

Display noise

TG18-NS

Similar to TG18-RV/TG18-RH, for noise evaluation

TG18-GV

Veiling glare (for visual evaluation)

TG18-GVN

Veiling glare (for visual evaluation)

TG18-GQ

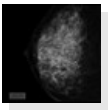
Dark-spot pattern for glare ratio measurement

TG18-CH

Anatomical chest pattern

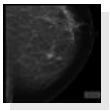
TG18-KN

Anatomical knee pattern



TG18-MM

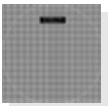
Anatomical mammogram pattern



TG18-MM2

Anatomical mammogram pattern

● DIN V 6868-57



DIN-GEOMETRY

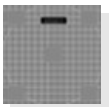
For evaluations on geometric properties such as distortion, line structure, artifact, and instability

DIN-GRAYSCALE

Grayscale reproduction evaluation

DIN-RESOLUTION

Resolution evaluation



DIN-LUMINANCE DEVIATION

Luminance deviation between the center and four corners (for quantitative evaluation)

SMPTE (▶p.39) is the same as the basic patterns.

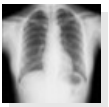
● JESRA

JIRA-BN01

Luminance response. The pixel value of the central region is 0.

JIRA-BN18

Luminance response. The pixel value of the central region is 255.



JESRA (Standard Image)

JESRA (Japan Engineering Standard of Radiation Apparatus) standard clinical image

JIRA-CHEST-QC

Combines the evaluation area of JESRA (Standard Image) and TG18-QC

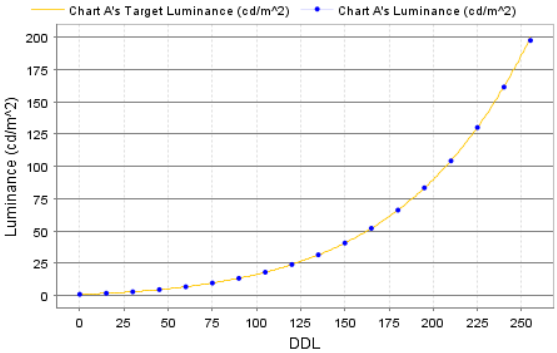
SMPTE (▶p.39) is the same as the basic patterns.

TG18-QC、TG18-LN8-01、TG18-LN8-18、TG18-UNL80 (▶p.39) are the same as the AAPM TG-18 patterns.

8.5 How to Read the Graphs

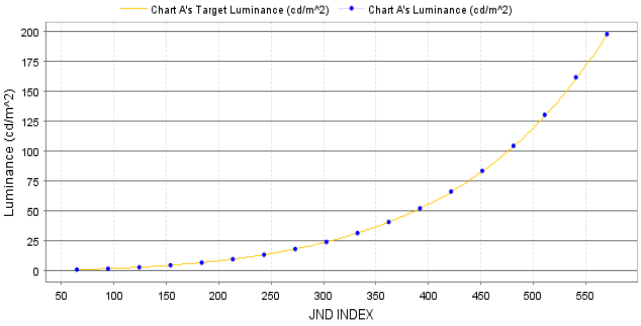
● DDL-L

Where X-axis is DDL, Y-axis is luminance. You can choose the scale of the axis between linear (default) and logarithmic. The full line represents the target according to the calibration settings and the dotted line indicates the actual measurement.



● JND-L

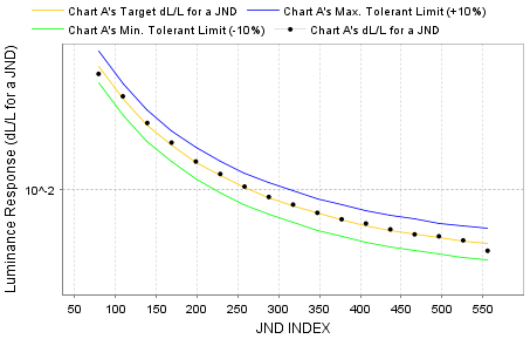
Where X-axis is JND (Just Notified Difference), Y-axis is luminance. You can choose the scale of the axis between linear (default) and logarithmic. The full line represents the target according to the calibration settings and the dotted line indicates the actual measurement. This graph is only available when the display was calibrated to DICOM GSDF (gamma setting).



● JND-dL/L per JND

Where X-axis is JND (linear scale), Y-axis is dL/L per JND (logarithmic scale). The X-axis

represents the linear scale, and the Y-axis represents the logarithmic scale. The full line represents the target according to the calibration settings and the maximum and minimum allowable limits, and the dotted line indicates the actual measurement. This graph is only available when the display was calibrated to DICOM GSDF (gamma setting).



When multiple calibration records are selected to create their graphs, select the record to show its graph in drop-down box of “Select a chart.”

The allowable deviation where Pass is decided on the graph is determined according to the QA testing standard and its performance class selected to apply for each display set with Agent Settings.[17]

QA testing standard	Performance class	Allowable deviation
AAPM TG18	Primary	±10%
	Secondary	±20%
JESRA X-0093	Grade 1	±15%
	Grade 2	±30%
DIN V 6868-57[18]	Class A	±10%
	Class B	±10%
Digital Mammography QA guideline	-	±15%

17 This standard is applied only for digital video input. This restriction does not apply for analog video input.

18 A luminance response deviation range is not set for DIN V 6868-57. This value is a proprietary standard value.

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Medivisor Nx Ver. 4.10 User's Manual
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Notes for the User's Manual

- No part of this manual, whether partly or wholly, may be reproduced or copied without authorization.
- The content of this manual is subject to change without notice.
- Although this manual has been prepared carefully, please let us know if you find any errors, omissions, or ambiguous explanations.

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